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IX. — *On the History and Migration of Cultivated Plants yielding Intoxicating Potables and Oils.* By J. CRAWFURD, Esq., F.R.S.

[Read March 10th, 1868.]

I SHALL endeavour in this paper to give an outline of the history and migration of the plants which have been chiefly employed for the production of intoxicating potables, the result of fermentation or of distillation, and of those yielding oils. The discovery of the art of manufacturing some kind or other of intoxicating beverage, may be said to be coeval with the first dawn of social development; for it has been soon made by barbarians of every race in possession of the requisite raw materials: it is mere wandering savages only that have been found ignorant of it. The first discovery of the art is, therefore, beyond our reach; but we may be sure that it was made at many different and independent points, varying with climate, and hence with the vegetable productions employed.

All plants containing starch and sugar will yield an intoxicating liquor by fermentation, the quality and quantity of which will vary with the product yielding it. In cold regions, where neither the vine, the sugar-cane, nor palms will profitably grow, intoxicating beverages are produced from the *cerealia*, or corns; and all of these, wheat, rye, barley, oats, maize, and millets will yield it, but of these barley in most abundance and at the smallest cost. In the first century of our era, Pliny and Tacitus state that a fermented liquor from corn was the beverage of all the Germanic nations known to them, and it continues still to be the ordinary drink of their descendants. We hence infer that the discovery of malt liquor was a native invention with the Germans, corroborated from finding that such words as malt, wort, beer, ale, are, with small orthographic variations, the same in all the Teutonic languages.

The Anglo-Saxons brought the art along with them to England, or rather, there imposed their own names; for we cannot infer from the mere nomenclature that the art of brewing was unknown to the Britons before the Anglo-Saxon invasion, for we have different and seemingly native names for such essential words as malt and ale, both in the Gaelic and the Welsh. Thus the name for malt in the first is *braich*, and for ale *leann*, while the Welsh name for malt is *brâg*, ale having three synonyms,—*heiddlyn*, *cwrw*, and *diød*.

The Gauls, before the Romans had extended the cultivation of the vine to their country, most probably had an ale or beer of their own; but to judge by language, it was the Franks who introduced it in later times, for the names, at least of beer and ale, in the French language, are obviously enough of German pedigree.

Even in countries where the culture of the vine was general, an ale or beer seems to have been in use. This appears to have been the case with the Romans, judging by their having a name for ale, or fermented liquor from malted corn, namely, *cerevisia*, a word which has been retained in the derivative Spanish as *cerveza*. The ancient Basques seem also to have had their ale; for in their language we have, to all appearance, a native name for it, namely, *gararinoa*. The ancient Egyptians, too, had, according to all accounts, an intoxicating beverage made from corn. The same may be said of at least the modern Persians, who have a beer which they call *buza*.

The Chinese of the northern provinces, although possessed of the vine, have never employed it for the making of wine, but make their fermented beverage from the greater millet, or *Holcus sorghum*. Within the tropics, where the chief corn is rice, an ale or fermented liquor is made from it. This applies to Southern India, Southern China, and the Malayan islands; and this is the case even where the palms abound. In the Malay and Javanese languages, this coarse and unsavoury beer is known under the names of *tapé* and *brâm*.

The beer consumed by the Germans and ourselves before the use of hops, must have been but a poor and perishable potation. Hops are said to have been first cultivated in England, not earlier than the reign of Henry the Eighth, the year assigned for their introduction being 1524. The country from which we received it was Flanders, and there we must conclude that the plant must have been previously employed in the manufacture of beer. The hop plant is said to be a native of Britain and Ireland, because found wild in hedges. This, however, seems doubtful, seeing that its culture has always been confined to a few of the southern counties of England, and that in the ancient languages of Wales and Ireland it has no native name.

All roots containing sugar or starch yield, by fermentation, as already stated, an intoxicating liquor; and those most employed (usually however, for the future preparation of spirits by distillation) are the common potato, the beet, and the manihots, or both the sweet and poisonous species of *Jatropha*. The last is the bread of the Brazilian Indians; but from the first a very intoxicating beverage is prepared, and much used. The yam and sweet potato, or *battata*, would equally yield an intoxi-

cating drink, but I am not aware that they have ever been employed for this purpose. In fact, the use of any root seems only to arise from necessity, in the absence of materials yielding products more abundant and agreeable.

The fermented juice of fruits has been immemorially used for the production of intoxicating beverages; and in southern Europe and western Asia the vine, the *Vitis vinifera* of botanists, has afforded the chief supply. Of the genus to which the wine-yielding grape belongs, there are several species; but it alone—diversified through long culture into many varieties—is the only one suited to the production of genuine wine.

The vine is probably an indigenous plant of several parts of western Asia, such as Persia, Syria, and Palestine; and even of southern Europe, such as Greece, Italy, and Spain. In all these places it is still found in the wild state. It may, indeed, have run into this condition from the cultivated state; but the different names for the plant in different languages would seem to point at its being indigenous in several widely different localities. Thus, we have it in Greek as *ampelos*; in Latin as *vitis* and *vinea*; in the Basque as *ardoa* and *matza*; in Persian as *anggur* and *raz*; in Arabic as *inab*; and in Sanskrit as *dakh*. In some languages we find the fruit bearing a different name from that of the plant. Thus, in Latin the grape is *uvum*, and in Greek a bunch of grapes has two different names, *staphulê* and *botrus*.

While men were yet wandering savages, the wild fruit of the vine would afford them but small sustenance. It would not be until they had increased in number, and made some progress in agriculture, that the vine would become an object of cultivation. But at what time this happened is far beyond the reach of history, since it must have taken place, and that, too, at many independent points, long before men had the capacity of recording their own actions. In Scripture, the culture of the vine, with even the art of making wine from its fruit, is mentioned at an epoch which, according to the usual computation, would carry us back nineteen centuries before the birth of Christ. The process of wine-making is unequivocally represented in the paintings of Egyptian monuments, and these will carry us to a time much earlier even than the Hebrew Scriptures. In the Homeric poems, the vine and its fermented juice are mentioned; and this takes us eight centuries before our era, to say nothing of the time which must have passed between that and the invention of the art.

The discovery of the art of making wine from the grape, seems to have been made in nearly every country in which the vine is indigenous, from Italy to Persia inclusive, taking these two countries to be, west and east, the native bound-

aries of the vine. The Roman conquests spread the culture of the vine; for the manufacture of wine from Italy to France, and from France it was extended to Germany, up to the fiftieth degree of latitude, for the production of good wine.

For the extension of the culture of the vine in Europe, I quote the following instructive passages from Gibbon: "In the time of Homer, the vine grew wild in the Island of Sicily, and most probably in the adjacent district of the Continent; but it was not improved by the skill, or did not afford a liquor grateful to the taste of the savage inhabitants. A thousand years afterwards, Italy could boast that of the fourscore most generous and celebrated wines, more than two-thirds were produced from her soil. The blessing was communicated to the Narbonese province of Gaul; but so intense was the cold to the north of the Cevennes, that in the time of Strabo it was thought impossible to ripen the grape in those parts of Gaul. This difficulty, however, was gradually vanquished; and there is some reason to believe that the vineyards of Burgundy are as old as the age of the Antonines" (*Decline and Fall*, vol. i, p. 91).

The spread of the vine may be traced from south to north by the name given to wine in all the languages of Europe. Thus, the *vinum* of the Latin is in Italian and Spanish *vino*, in French *vin*, and in German *wein*. Even in countries where the vine, from inclemency, has not been cultivated for the making of wine, the name has the same origin, for there can be no doubt but that the English *wine*, the Welsh *gwin*, and the Gaelic *fion*, come indirectly from the Latin *vinum*. In the European languages there is but one exception that I am aware of, the Basque, in which wine has the same native names as the vine itself, namely, *arboa* and *matsa*. In Greek, the name for wine is *oinos*, or written with the digamma, as it is in the Homeric poems, *voinos*. This is considered by some philologists as the same with the Latin *vinum*; and if this be so, it would indicate that it was the Greeks who instructed the people of Italy in the manufacture of wine. For this observation I am indebted to the learning of my accomplished friend, the Hon. Edward Twistleton, without which, indeed, I should not have ventured an opinion on a subject to which I am much a stranger.

The vine is cultivated in eastern countries, for the making of wine, only as far east as Persia, of which the plant is stated to be a native,—a fact which would seem, indeed, to be implied by the existence in the Persian language of two names, *angur* and *raz*, not traceable to any foreign tongue. The Arabic has also a native name for the vine, *inab*, but from what source de-

rived I am unaware. The Sanskrit, too, has its own name, *draksha* becomes *dakh*, in the most current language of Northern India. It may be presumed, however, that this word was applied only to some species of uncultivated grape,—a conclusion to which I come from finding that the vine was not cultivated in Upper India, even at so late a time as the beginning of the sixteenth century, a fact stated in the celebrated Memoirs of the emperor Ackbar. Indeed, the vine is currently known throughout India only by its Persian name. At present it is cultivated for its fruit only, which is of a tolerable quality; but a superior kind is annually imported from the country of the Afghans, far more congenial to it.

In the northern provinces of China, the vine is cultivated successfully for its fruit; but it is remarkable that the Chinese, so superior to other Asiatic nations in the industrial arts, and especially in agriculture, should never have fallen upon the art of making a fermented liquor from the grape. The likelihood is that the vine was introduced into China only in comparatively modern times, and probably from Persia, through the Turks or Mongols. The monosyllabic languages of China, in this and similar cases, afford us no assistance; for the Chinese either disfigure foreign names so that they are not recognisable, or substitute for them fanciful names of their own.

The vine, for the production of good wine, depends more on climate, soil, and locality than, perhaps, any other cultivated plant, unless tea be an exception. All fine wines are limited to the twelve degrees of latitude which lie between the 36° and 48°. But quality depends also on soil and on skill in culture and manufacture,—the last condition, a question it may be presumed of civilisation, since France produces the finest wines under the seeming disadvantage of the vine being an exotic. In this case it is as if, through mere skill in cultivation, the coffee of Java or Ceylon were made to excel that of Arabia, or the tea of Assam that of China. No rude people ever made good wine.

The vine has been carried by European nations to all their extra-tropical colonies in the New World and the Antipodes, but it is remarkable, hitherto without marked success, although some approaches to it have been made in America and Australia. If, however, we are to judge by the example of France, which, when the vine was introduced into it was in reality a colony of Rome, the successful cultivation of the vine may be looked for in America and Australia.

Next to the vine, the fruit which has been most used for the production of an intoxicating fermented liquor is the apple. For this purpose it is cultivated in climates congenial to it, but

unfavourable to the growth of the greatly superior vine. In Europe, cider is produced only in the northern part of France, and the southern of our own country; and in these, as the common beverage of the people, it supersedes wine, and to a considerable extent even beer. In southern Europe and in temperate western Asia it is unknown.

The name for the fermented juice of the apple in our own language is, with very slight alteration, the same as the French, and it is the same with the other languages of Europe, including even the Italian and Spanish. The origin of the word cider has not been traced, and as the Romans were unacquainted with the beverage, it may be presumed that the liquor was an invention of the Romanised Gauls as a substitute for wine where the grape refused to grow for the production of wine. This would include Normandy, and it was probably the Normans who first introduced the manufacture into England. This conjecture would seem to be strengthened by the fact that cider has no name in the native languages of Wales and Ireland, although some parts of both these countries are favourable to the growth of the apple, and do in fact produce cider.

What applies to cider is equally applicable to perry. The name of the pear is, indeed, taken from the Latin, but the Romans knew no more of the fermented juice of the one than they did of that of the other, and our own is but a trifling corruption of the French word. It may be concluded, therefore, that perry, like cider, was most probably introduced into England by the Normans.

In a few parts of temperate America the apple, although an exotic, grows to greater perfection than in Europe and Western Asia, of both of which it is a native plant, and in these the manufacture of cider introduced from England is largely carried on.

The juice of the peach also has been used, both in America and Australia, for the production of a fermented liquor, but only for the purpose of being subsequently subjected to distillation.

The fruit of the date palm yields an intoxicating fermented liquor, and this was the humble beverage prohibited under the name of "wine" in the Koran, and we must presume that the heathen Arabs were much addicted to it, since Mahomet thought it worth while to interdict its use.

In the north of Europe, the berry of the juniper contains sufficient saccharine matter to produce a fermented liquor, and in some parts of tropical America the banana or musa is used for the same purpose.

The negroes of the western coast of Africa make a fermented liquor, and ultimately a distilled spirit from the fruit of the

cashew (*Anacardium occidentale*), but this must be a comparatively modern resource, since the cashew is a native of America, and must have been introduced into Africa by modern European agency.

From the berry-like flowers of a tree of India, which, when dried, resemble raisins, the Hindus have immemorially made, first a fermented liquor and then a distilled spirit. The tree in the Hindi language is called the *mahwa*, a corruption of the Sanskrit *mahduka*. It is the *Bassia latifolia* of botanists, of the family of the *Sapotæ*, the same to which the butter tree belongs. In one of his financial reports, Sir Charles Trevelyan says that the distilled spirit "is weak and perishable, and stands in the same relation to the people of India as beer does to the labouring classes of England."

The family of palms extends up to the fortieth degree of north and the thirty-fifth of south latitude, but is frequent only within the tropics. According to Dr. Royle, botanists have already described no fewer than two hundred and thirty-one species, and all of them, by cutting their flowering stem, yield a large quantity of sweet sap or "must," which, in a few hours after collection, runs into the vinous fermentation, and is then highly intoxicating. It is in tropical India, the countries adjacent to it, and in the Malay and Philippine Islands, that this beverage is chiefly used. In Continental India the palms chiefly employed for this purpose are the *Corypha talliera* and *Borassus flabelliformis*, both of which are called by the natives by the name of *tal* or *tar*, and the last by Europeans the *palmyra*. Another palm which yields a potable sap, in India, is the *Coryota urens*, and a fourth is the *Phoenix silvestris* or wild date. In the Malay Islands the palm chiefly used is the *sagwire*, or *Borassus gomuti*, called also the *Arenga saccharifera*. In the Philippine Islands it is the Nipa palm which is chiefly used. The coco and areca palms would equally furnish a sap, but are not employed for this purpose on account of the value of their fruit.

The negroes of Africa probably borrowed the art of extracting the sap of palms from the Hindu settlers of the eastern coast, but it is remarkable that the art has never been discovered by the native Americans, and this is the more remarkable when it is considered that of all the known palms, the New World supplies no fewer than 175, while Asia furnishes but 42, and Africa but 14. This fact, taken with ignorance of iron and of oil and wax, for giving light, must, I think, be considered as evidence of the intellectual inferiority of the red man compared with the Asiatic, since all these inventions have been immemorially known even to many of the rudest races of Asia.

The produce of a single palm tree is estimated in continental

India at from sixty to one hundred and twenty gallons of sap during the season, and the importance attached to this product by the people who consume it, whether as a potable or when converted into sugar, may be judged by our finding it distinguished in each separate language by one or more distinct native names, in the same manner as we distinguish by several names the produce of the vine from that of the plant. This implies clearly enough that the people making such distinctions had at a very early time discovered for itself the art of extracting the sap. Thus in Hindi we have the name as *tare*, often pronounced by the substitution of a palatal *d* for *r*, *tadi*, and it is the last form of this word which has become the English word *toddy*. Our countrymen no doubt thought they made a considerable improvement on palm wine when they imitated it with diluted rum and sugar.

But although the Americans had not discovered the art of extracting the sap of palms, they had discovered that of extracting the sap of another plant, unknown to Africa and Asia. This art was formerly restricted to a single people, the Mexicans, the most advanced of the American race, and to a single locality, the plateau of Anahuac. The plant that yields it is the American aloe, or *Agave Americana*, which for size and longevity bears the same relation to other liliaceous plants that the bamboo does to other grasses. It is extensively cultivated in the Mexican valley, its sap under the native name of *Pulqué* being the substitute of the beer and the wine of Europe, and of the palm wine of tropical Asia and Africa. "I do not exaggerate," says Mr. Edward Taylor, in an excellent work, containing the best account that I have seen of the Mexican table-land, "when I say that we saw hundreds of thousands of the agave plants that day planted in long regular lines. Among them were walking the Indian Tlachiquaos, each with his pigskin on his back and his long calabash in his hand, milking such plants as were in season."

All fermented liquors that have undergone the vinous fermentation, from whatever source derived, of course yield spirits by distillation. The art of distillation was, like the art of making sugar, unknown to Greeks and Romans, to Egyptians, to Jews, Assyrians,—even to the nations of the middle ages of Europe, down to the thirteenth century. The art is supposed to have been received from the Arabs of Spain; but if this were the case the Arabs must have long kept the art to themselves, or they could not have been long in possession of it, for in the thirteenth century they had been already full five hundred years in Spain. I believe there exists no record which traces the art to the Arabs, and the only ground for supposing them to have been the

parties from whom the invention was received by Europeans consists in a few Arabic words connected with the process of distillation, such as, alembic and alcohol. Against their claim, however, it may be urged that the Arabs, although they adopted and perhaps may sometimes have improved the arts of the nations whom they conquered, invented themselves no new art, as did the Chinese and even the Hindus.

It seems most likely that the alchemists of Europe, in the course of the many empirical experiments which they made, fell upon the discovery of alcohol, as they certainly did upon several other inventions. When they first made it, they imagined they had at length found the universal panacea, and the name which they gave to the newly-invented liquor points in many of the languages of Europe to this belief. Thus we have the Latin *aqua-vitæ*, the Italian *aguavita*, the French *eau-de-vie*, the Irish *usque-baugh*, that is, "water of health", which by a wonderful corruption becomes the English *whiskey*.

It is difficult through etymological evidence, and there is no other, to show whether the oriental nations had immemorially possessed a knowledge of making an ardent spirit by the process of distillation; for, in general, their languages make no clear distinction between fermented and distilled spirits. Thus, in Arabic we have three different names, *arak*, *khamar*, and *sukr*. The first of these, which has been adopted by all the Eastern tongues that have received any considerable infusion of Arabic, has the primary meaning of "sap" or "juice," spirits or alcohol being only a secondary one. The two last words mentioned mean any intoxicating liquor equally with ardent spirits.

The Sanskrit has three different names for ardent spirits, namely *mad*, *madhu*, and *barani*, but it is probable that, like the Arabic names, they apply equally to any intoxicating drink. The Hindi has certainly one clear name for alcohol, namely *daru*, but I have no means of tracing its origin. The Tamil has also a native name, *savayum*. In Javanese the term for ardent spirit is *brâm*, but it is the same as for fermented liquors. In Malay the native name is *gilang*, or *ayar-gilang*, which signifies "bright or refulgent water," evidently a factitious word. But the usual name both in Malay and Javanese is the Arabic one *arak*, although they also use the Chinese name *chu*.

The art of distillation is now practised by the Chinese, and seems to have been so immemorially, and it is easy to believe that the discovery would be made by a people who, without any foreign aid, were certainly the inventors of sugar, of silk, of tea, of paper, and of porcelaine. The process followed is peculiarly their own, and has, therefore, every appearance of being indigenous. If therefore the people of Western and Central

Asia learnt the art of distillation from strangers, these strangers were probably the Chinese, the same people from whom they acquired the art of making paper and silk.

The opinion thus given respecting the discovery of distillation by the Chinese I give on the personal authority of my friend Sir John Davis, the first living authority on all questions respecting the great and ancient Chinese Empire. According to him, the still or alembic, now made of tin or iron, was in ruder times made of coarse earthenware, and hence its name *Tseng*, which signifies "a red tile." This is the name given to the still, whether employed in the distillation of ardent spirits or of drugs and perfumes; in the last case, however, having the word *ajo* prefixed, the compound then literally signifying "physic-still." The word *chu*, borrowed, as I have already stated, by the Malays, is the term for all intoxicating potables, like the *shrab* of the Arabs, and indeed our own word *wine* used generically.

All fermented liquors that have undergone the vinous fermentation yield an alcoholic spirit by distillation, the quality of the product depending on that of the raw material. Thus we have in progression, brandy from the vine, whiskey from barley, and genievre from the juniper berry. This last is the word corrupted by us into geneva, of which gin, an imitation of the genuine liquor, is a further corruption. The fermented sap of the sugar-cane yields rum, an English word, alleged by some to be taken from a cant name for a country parson, and which the French have adopted, writing the word *rhum*, and the Spanish writing it *ron*.

From the apple the Anglo-Saxon Americans distil an ardent spirit which goes under the name of apple-whiskey, and from the peach they make peach-brandy, much inferior to the spirit from the grape. From the fermented liquor of every kind of cereal an ardent spirit is produced, from our own whiskey, usually the production of barley, to the Chinese *chu*, vulgarly *shamshu*, made in the Northern Provinces from the greater millet, the *Holcus sorghum*, and in the Southern from rice. From a combination of sugar, palm wine, and rice the Chinese settlers of Batavia distil the ardent spirits well known by the Arabic name of *arak*, usually written *arrack*, and in pronunciation reduced to a monosyllable by the rejection of the initial syllable. The Mexicans having acquired the art of distillation from the Spaniards, make a spirit from *pulque*, the fermented sap of American aloe or agave.

In Sweden and Norway, where the cereals are scarce, a distilled spirit, a very inferior article, is made from the potato, and the Americans of the tropics make one also from the man

dioca, the art of distillation having been in this case also acquired from the Spaniards or Portuguese.

It appears from the facts stated in the course of this paper that the use of intoxicating beverages, the result of the fermentation of vegetable products, is now, and has been from the earliest records of man, almost universal, the exceptions being confined to a few savages, without the skill or materials for their production; such as the natives of the Andaman Islands, of Australia, and of Tierra del Fuego. The people of the South Sea islands substitute for them the intoxicating juice of a species of pepper, the *Piper methysticum*, from its making the far-famed and filthy *kava*. The nomadic nations of central and northern Asia substitute for the fermented liquors drawn from vegetables, that which is produced from the milk of the mare and camel, the oft-described *kimis*, sourer than the most acid cider.

Mahomed prohibited the use of strong drink made from the fermentation of dates; but as he made no mention of opium or hemp juice, the Mahomedans do not think it unlawful to besot themselves with these drugs. At its first introduction, even coffee had a struggle to maintain itself against Mahomedan purists, who were for including it among forbidden drinks, because it bore an obsolete name for wine. The inhibition of wine is equally commanded by the Hindu religion as by the Mahomedans; but it is generally disregarded by the lower orders, while the higher substitute for it the juice of the poppy and of hemp. The Buddhist religion is even more stringent in its prohibition of strong drinks than the Mahomedan or Hindu; but it does not hinder the Buddhist Chinese, equally with the Confucians, from partaking of them freely and habitually, but also, it should be added, discreetly, for a drunken Chinese is seldom to be seen.

I come now to a brief account of the migration of plants yielding oleaginous products. In cold climates, oily substances for economical use are the products of the animal kingdom; in temperate climates, both of the animal and vegetable; and in hot ones they are, with few exceptions, the products of vegetables.

Among plants cultivated for their oil, some have a wide geographical range; while others, even under similar climates, are confined to comparatively narrow provinces. To the latter class belongs the olive, by far the most important of the oleaginous plants of Europe. The olive has been cultivated, from the remotest antiquity, in Greece, Italy, Egypt, Syria, Asia Minor, and partially in Gilan, the most western province of Persia, but nowhere further east.

In Africa (excepting its Mediterranean coast), in America, and in every part of central eastern and southern Asia, the olive, whether as an indigenous plant or as an exotic, is unknown as an object of culture. Nor have the colonists of European nations introduced it into such parts of America and Australia as, in so far as climate is concerned, would seem well adapted to its culture.

Of what country the olive is specially a native it is impossible to determine with any precision ; but it is certainly found in its wild, uncultivated state, in Syria. Etymology will but feebly aid us even in tracing its migration. The Latin name, *olea*, is nearly the same as the Greek ; and as we have no means of tracing the word beyond the Greek language, we must consider the Greek word as a native one, and hence the olive to be a native plant of Greece. It may, indeed, have been introduced into that country from Syria or Asia Minor, but we have no authority for asserting that it was so. We may readily believe, however, from its Greek name, that it was the Greeks who introduced the culture of the olive into Italy, from which the conquests of the Romans extended it to Spain, and to the south of France, its extreme geographical limit northward. In all the languages derived from the Latin, the name for the olive is obviously taken from that tongue. So it is in the Teutonic, the Slavonic, and the so-called Celtic languages. Even the common term for "oil" in all these languages seems to be taken from the Latin name of the olive, as in the examples of the *oel* of the German, our own oil, and the *ola* of the Gaelic. The Spanish adds a synonym taken from the Arabic, namely, *aceite*. The Persian name of the olive, *zeitun*, has no relation whatever with the Greek name ; and therefore, in so far as linguistic evidence is to be trusted, the plant must be looked upon as indigenous in Persia. In Arabia the olive is called *zeit* ; but this is also a synonym for the generic term "oil", and this is the word which, with the Arabic article, becomes in Spanish *aceité*.

The *sesame*, the *Sesamum orientale* of botanists, is the plant chiefly grown for oil in temperate climates, where the olive is unknown, and in warm ones, where the cocoa-nut will not thrive. The geographical bounds for the *sesame* extend from the equator to at least the thirtieth degree of latitude, and its culture may be said to extend from Africa to Japan, both included ; but it is not an indigenous plant of the New World, and is wholly foreign to Australia and the islands of the North and South Pacific Oceans.

To judge by the many different names of the *sesame* in many languages, we must conclude it to be a native of many different

regions. Thus, its correct Arabic name is *simsim*, its Persian, *kunjad*, its Sanskrit and Hindi, *til*, and its Tamil, *yellu* : in Javanese it is *wijin* or *bijin*, and in the two most cultivated languages of the Philippines, *lānga*, which, however, is only the Javanese word for “oil”. The French name, *sesame*, evidently taken from the translation of *The Arabian Nights’ Entertainments*, furnished the European form of the word, the genuine one being *samsam*. The Spanish, *ajonjoli*, is taken from another Arabic name. We have of late become economically acquainted with the *sesame* ; for we now import it largely to crush for its oil, under its Hindu name of *til*.

The coco-palm (*Cocos nucifera*) is the great source of oil in equinoxial regions not remote from the sea, and this, whether in the Old or New World, or the islands of the Pacific Ocean. It is a sublittoral plant, growing but indifferently at any considerable distance from the sea.

In Sanskrit, the name of the coco-palm is *nargil*, in Hindi, *naryal*, and in Persian and Arabic it is *narjil*, most probably the same word. In Tamil it is a totally different one, *taingkai*. In the language of Java we have it as *kalapa*, corrupted in the leading language of Celebes into *kaluka*. In Malay, we find the name as *ñur*,—a word which has had a very wide currency, for we have it in the principal languages of the Philippines turned into *ñog*, in Javanese, as a synonym, as *ñu* : it is evidently also the same word which appears in the dialects of the great Polynesian tongue spoken in the Sandwich and Friendly groups as *niu*. It is probably even the same word which appears in the Tahiti and Marquesa dialects of the same tongue, in the form of *ehi*, for the transmutation of all foreign words in the language of the Polynesian non-negro people is almost unlimited, owing to the paucity of its consonants, and consequent incapacity of correctly expressing foreign sounds. This etymology would lead to the belief that it was the Malays who introduced the coco-palm into the islands of the Pacific, or at least who taught their inhabitants the art of cultivating it. All the dialects of the language of the Polynesians, whether of brown complexion and lank hair, or of black-complexion and woolly hair, contain more or less of Malay words, and these, nearly all indicating social progress, as in the example of the numerals, the names of tools, and those of cultivated plants.

But the Malayan name of the coco-palm has a yet wider extension in a western than it has in an eastern direction ; for we find it, along with the Malayan numerals, in the language of Madagascar, at the distance of 7,000 miles from its furthest eastern extension. The name in this case is *büanü*, a com-

pound word, but little disfigured, taken from the Malay words *buah ñor*, signifying literally “fruit of the coco-palm”.

The ancient Greeks and Romans appear to have been wholly unacquainted with the coco-palm. The Greeks, who visited only the northern parts of India, would, of course, not have seen a plant confined to the borders of the sea, and limited by the tropics; and their merchants who visited the western coast, who must have seen it, have not left any account of it. Even in the *Periplus* of the Erythrean Sea, written during the Roman occupation of Egypt, I do not find any mention made of it.

The name of the coco-palm in English, French, Italian, Spanish, and Portuguese, is said to be taken from the name for a monkey in the last of these languages, namely, *maiaco*, from the supposed resemblance, of that end of the nut which is marked by three scars, to the face of that animal,—a possible derivation, but certainly a very whimsical one.

The ground-nut, the *Arachis hypogæa* of botanists, is a leguminous plant, at present much cultivated in some places for food; but far more generally for its abundant oil in many parts of tropical Africa, Asia, and America. It seems to be a native plant of Africa, carried, in comparatively very modern times, to the tropical parts of America. Its culture is hardly known in Continental India, in the languages of which I can barely find a name for it. The Hindus of Upper India call it *Chini-bâddam*, literally, “the Chinese almond”, evidently a fabricated name of modern imposition. But among the islands of the Malayan and Philippine archipelago, and away from the seacoast, where the coconut palm does not flourish, it is largely cultivated, as in the interior of Java, where it forms the chief source of esculent oil, and where it seems in a good measure to have superseded the less productive *sesame*. In the Malay and Javanese languages, it is generally known by the name of *cachang-tanah*, which literally signifies “ground pulse”, taken from the peculiar habit of the plant of maturing its seed under ground. But it also goes under the names of Japanese and Chinese pulse, and not improbably it may have been first cultivated in the Malayan countries by one or other of these nations; for both frequented them when Europeans first traded with them.

In the most current language of China, the ground-nut goes under the name of “the vegetable of long life”. It has been immemorially and extensively cultivated in the southern provinces for its abundant oil, and we may, therefore, presume it to be a native plant of China as well as of Africa.

Into tropical America, and its islands, it was probably introduced direct from Africa along with African slaves. The

seeds chiefly used for oil make the ground-nut a valuable acquisition to warm and hot countries, which are always deficient in animal oils. They are at present an object of import into this country for crushing.

The castor-oil plant, or *Palma Christi*, is an object of cultivation from the equator up to the thirtieth degree of latitude. The genus of plants to which it belongs, the *Ricinus*, consists of seven species; and the oil-giving one, *Ricinus communis*, sports into several varieties. It is usually considered to be a native of Asia, but has spread to tropical and sub-tropical Africa and America. Corresponding with the many countries of which it is a native, or in which, at least, it has been immemorably cultivated, it bears many names. Thus, in Sanskrit we have it as *arand*, of which the *and* of the Hindi is an obvious corruption. In Tamil, it is called *amunak*, in Persian, *garchek*, and in Malay, *jarak*. The medical properties of the oil of the *Palma Christi* are known to, or at least availed of only in Europe. In the countries in which it is cultivated, it is used as a burning oil only. In tropical Asia, it takes the place, for this purpose, of the olive, and is largely cultivated as far west as Persia.

The African palm, named by botanists *Elais Guiniensis*, affords a valuable and abundant supply of oil by the crushing of its seeds, which are of the size of an ordinary plum. It seems to be confined to the western coast of tropical Africa. Some notion of the importance of this commodity may be formed from the fact, that a few years ago it was known only as contributing to the food of the barbarians of Africa, while it is now imported for the lubrication of European machinery, and the manufacture of soap, to a great extent; so that the manufacturers of Europe may be said, without being themselves in the least aware of the good they are doing, to have contributed more, by the encouragement given to honest industry, to the civilisation of Africa, than treaties, squadrons, or even missionaries.

The seeds of flax, of the poppy, of a species of tea, and of various cruciform plants, such as the rape and mustard, furnish large supplies of oil for economical uses; but as the plants themselves are considered in their respective places, under their appropriate heads, it is not necessary to treat of them in this paper.
